May 5, 2005 TSTF-05-06

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

SUBJECT: TSTF-484, Revision 0, "Use of TS 3.10.1 for Scram Time Testing activities"

Dear Sir or Madam:

Enclosed for NRC consideration is Technical Specification Task Force Traveler TSTF-484, Revision 0, "Use of TS 3.10.1 for Scram Time Testing activities."

TSTF-484 revises LCO 3.10.1, "Inservice Leak and Hydrostatic Testing Operation," to include operations in which reactor coolant system temperature exceeds 200°F as a consequence of maintaining reactor pressure. This will allow more efficient testing during a refueling outage.

Any NRC review fees associated with the review of TSTF-484, Revision 0, should be billed to the Boiling Water Reactors Owners Group.

Should you have any questions, please do not hesitate to contact us.

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Enclosure

cc: Thomas H. Boyce, Technical Specifications Section, NRC

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Technical Specification Task Force
Improved Standard Technical Specifications Change Traveler

Use of TS 3.10.1 for Scram Time Testing activities

NUREGs Affected: ☐ 1430 ☐ 1431 ☐ 1432 ☑ 1433 ☑ 1434

Classification: 1) Technical Change | Recommended for CLIIP?: Yes

Correction or Improvement: Improvement | NRC Fee Status: Not Exempt

Benefit: Shortens Outages

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1.0 Description

The Special Operation LCO 3.10.1, "Inservice Leak and Hydrostatic Testing Operation," allowance for operation with the average reactor coolant system temperature > 200°F while considering operational conditions to be MODE 4, is extended to include operations where temperature exceeds 200°F as a consequence of maintaining reactor pressure for inservice leak and hydrostatic test, or as a consequence of maintaining reactor pressure for scram time testing initiated in conjunction with an inservice leak or hydrostatic test, when initial test conditions were below 200°F. This will allow more efficient testing during a refueling outage.

2.0 Proposed Change

Currently LCO 3.10.1, "Inservice Leak and Hydrostatic Testing Operation," allows for operation with the average reactor coolant system temperature > 200°F while considering operational conditions to remain MODE 4 (i.e., < 200°F) solely to allow performance of an inservice leak or hydrostatic test provided certain secondary containment operability requirements are imposed consistent with operation in MODE 3 (i.e., > 200°F). The Bases relate the intent of this allowance would be solely when minimum temperature limitations imposed for the hydrostatic pressure test would require operation above 200°F.

The proposed revision to LCO 3.10.1, and the associated Bases, will expand the scope to include provisions for temperature excursions > 200°F as a consequence of inservice leak or hydrostatic testing, and as a consequence of scram time testing initiated in conjunction with an inservice leak or hydrostatic test, while considering operational conditions to be MODE 4.

In summary, the Special Operation LCO 3.10.1, "Inservice Leak and Hydrostatic Testing Operation," allowance for operation with the average reactor coolant system temperature > 200°F while considering operational conditions to be MODE 4 (i.e., cold shutdown), is extended to include operations where temperature exceeds 200°F as a consequence of maintaining reactor pressure for inservice leak and hydrostatic test, or as a consequence of maintaining reactor pressure for scram time testing initiated in conjunction with an inservice leak or hydrostatic test, when initial test conditions were below 200°F. Bases changes are also included to more clearly describe the activities and allowances for parallel activities during these evolutions.

3.0 Background

Hydrostatic and leakage tests of the reactor coolant system are required by Section XI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code). Hydrostatic tests are required to be performed once every 10 years and leakage tests are required to be performed each refueling outage. The only significant differences between the hydrostatic and leakage tests are the higher pressure and hold time for a hydrostatic test prior to performing examinations. ASME Code Cases N-416-2 and N-498-4 allow hydrostatic tests to be performed at the same pressure as leakage tests, which is the nominal operating pressure.

Appendix G to 10 CFR Part 50 states that "pressure tests and leak tests of the reactor vessel that are required by Section XI of the ASME Code must be completed before the core is critical." These reactor vessel hydrostatic and leakage tests are performed with the reactor pressure vessel in an essentially water-solid condition using reactor recirculation and control rod drive (CRD) pump operation to achieve the required test temperatures and pressures. Due to the elevated pressures, the normal residual heat removal shutdown cooling mode (RHR-SDC), is not in service. The minimum allowed temperatures for these tests are conservatively based on the fracture toughness of the reactor vessel, taking into account anticipated neutron fluence. With increased reactor vessel fluence over time, the minimum allowable vessel temperature increases at a given pressure. Periodic updates to the RPV P/T limit curves are performed as necessary, based upon the results of analyses of irradiated surveillance specimens. Hydrostatic and leak testing may eventually be required with minimum reactor coolant temperatures > 200°F.

With the required reactor coolant temperature above 200°F, the TS normally require that primary containment integrity be maintained. Establishing primary containment integrity requires that all openings be secured including installation of the drywell head. Installation of the drywell head and carousel (flashing type insulation) restricts access to the reactor vessel head area for required reactor vessel hydrostatic and leakage test inspections. The restricted access to the reactor vessel head combined with the elevated test temperature makes performance of the required inspections a personnel safety concern.

Control rod scram time testing is also performed after each refueling outage with reactor pressure above 800 psig in accordance with TS Surveillance Requirement (SR) 3.1.4.4. Often, scram time performance testing is partially or completely performed in conjunction with the inservice leak or hydrostatic testing, even though SR 3.1.4.4 allows for completion of the required scram time performance verification to be deferred through startup operations prior to reaching 40% RTP. Performance of scram time testing during the outage can represent a significant critical path reduction in returning to full power operations and can avoid the undesired extended operation in the 25% to 40% power range.

While scram time testing is allowed and is typically scheduled in parallel with the inservice leak or hydrostatic testing, for larger core BWRs, scram time testing may not be completed prior to completion of the inservice leak or hydrostatic testing activities. Two situations that can arise are addressed with this proposed change:

(1) If hydrostatic testing was being performed at > 200°F, in accordance with LCO 3.10.1, upon completion of the inservice leak and hydrostatic testing, scram time testing would have to be suspended since the provisions of the LCO would no longer apply. Typical practice would be to resume scram time testing during power operations prior to exceeding 40% RTP.

(2) When plant-specific minimum temperature for hydrostatic pressure testing does not require reactor coolant temperature > 200°F, inservice leak and hydrostatic testing (including scram time testing) can commence without utilizing the allowance of LCO 3.10.1. However, temperature control limitations (e.g., RHR-SDC is isolated at elevated pressures) may result in temperatures drifting upward towards 200°F (reference Susquehanna Unit 1 Licensee Event Report (LER) 2002-008, dated February 2, 2004). Since the plant-specific temperature limitations do not require exceeding 200°F, the allowance of LCO 3.10.1 is interpreted to not apply; necessitating suspension of testing, reduction of pressure and temperature, and reestablishing test conditions after sufficient heat removal/temperature reduction is completed. In the case of incomplete scram time testing, typical practice is to defer completion of testing during power operations prior to exceeding 40% RTP.

The proposed change will extend the provisions of LCO 3.10.1 to the above situations to allow completion of outage testing activities in an efficient, expeditious, and safe manner, without resulting in any adverse impact to public health and safety.

4.0 Technical Analysis

The existing provisions of LCO 3.10.1 provide the allowance to consider plant operation to be in MODE 4 with reactor coolant temperature > 200°F, while imposing MODE 3 secondary containment requirements. This allowance is provided only when hydrostatic and leak testing requires minimum reactor coolant temperatures > 200°F, but also does not preclude concurrent control rod scram time testing.

Since the tests are performed nearly water solid, at low decay heat values, and near MODE 4 conditions, the stored energy in the reactor core will be very low. Small system leaks would be detected by leakage inspections before significant inventory loss occurred. In the event of a large primary system leak, the reactor vessel would rapidly depressurize, allowing the low-pressure core cooling systems to operate. The capability of the low pressure coolant injection and core spray subsystems, as required in MODE 4 by LCO 3.5.2, "ECCS - Shutdown," would be more than adequate to keep the core flooded under this low decay heat load condition (References 1, 2, and 3). As such, the probability of core damage is considered to be below the level considered credible (Reference 2). Releases to the environment will therefore be conservatively bounded by the consequences of the postulated main steam line break outside of primary containment, without credit for secondary containment or filtration.

Additionally, the existing allowance of LCO 3.10.1 also conservatively requires the secondary containment and standby gas treatment system to be OPERABLE, and capable of handling any airborne radioactivity or steam leaks that could occur during the performance of hydrostatic or leak testing. Therefore, these requirements will conservatively limit radiation releases to the environment.

The proposed change will extend the allowance to include operations where temperature exceeds 200°F as a consequence of maintaining adequate pressure for inservice leak and hydrostatic testing, when initial test conditions commenced below 200°F. As such, no new operational conditions beyond those currently allowed by LCO 3.10.1 are introduced. The extended allowances would result from operations that commence at reduced temperatures, but approach the normal MODE 4 limit of 200°F prior to completion of the inspections or testing. The flexibility will allow continued inspection and testing activities without imposing the potential for interruption to steady state test pressure while reactor coolant temperatures are reduced to maintain < 200°F conditions.

Additionally, the proposed change will extend the allowance to include operations where temperature exceeds 200°F as a consequence of maintaining pressure for continued scram time testing that was initiated in conjunction with an inservice leak or hydrostatic test. Currently, if scram time testing is not completed during the normal inservice leak or hydrostatic test conditions, and temperatures approach 200°F, completion of scram time testing is suspended and resumed during reactor startup - typically between 25% and 40% RTP (i.e., above the low power setpoint, but prior to the power limit imposed by SR 3.1.4.4). By extending the provisions of LCO 3.10.1 to scram time testing, more efficient test scheduling can be realized. Furthermore, allowing for efficient scheduling to complete scram time testing prior to reactor criticality and power operations allows for implementing a more conservative operating philosophy with attendant potential safety benefits.

For the purposes of these tests, the protection provided by the normally required MODE 4 applicable LCOs, in addition to the secondary containment requirements required by this Special Operations LCO, ensures acceptable consequences in the event of any postulated abnormal event. Furthermore, extending the allowances to these additional conditions does not create any new modes of operation or operating conditions that are not currently allowed by LCO 3.10.1.

5.0 Regulatory Analysis

5.1 No Significant Hazards Considerations

The TSTF has evaluated whether or not a significant hazards consideration is involved with the proposed generic change by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No. Technical Specifications currently allow for operation at > 200°F while imposing MODE 4 requirements in addition to the secondary containment requirements required to be met. Extending the activities that can apply this allowance will not adversely impact the probability or consequences of an accident previously evaluated.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No. Technical Specifications currently allow for operation at > 200°F while imposing MODE 4 requirements in addition to the secondary containment requirements required to be met. No new operational conditions beyond those currently allowed by LCO 3.10.1 are introduced. The extended allowances would result from operations that commence at reduced temperatures, but approach the normal MODE 4 limit of 200°F prior to completion of the inspections or testing. The changes do not involve a physical alteration of the plant (i.e., no new or different type of equipment will be installed) or a change in the methods governing normal plant operation. In addition, the changes do not impose any new or different requirements or eliminate any existing requirements. The changes do not alter assumptions made in the safety analysis. The proposed changes are consistent with the safety analysis assumptions and current plant operating practice.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No. Technical Specifications currently allow for operation at > 200°F while imposing MODE 4 requirements in addition to the secondary containment requirements required to be met. Extending the activities that can apply this allowance will not adversely impact any margin of safety. Allowing completion of inspections and testing and supporting completion of scram time testing initiated in conjunction with an inservice leak or hydrostatic test prior to power operation, results in enhanced safe operations by eliminating unnecessary maneuvers to control reactor temperature and pressure.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, the TSTF concludes that the proposed change presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

5.2 Applicable Regulatory Requirements/Criteria

The proposed change does not change the design requirements or the assumptions in the safety analysis. In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the approval of the proposed change will not be inimical to the common defense and security or to the health and safety of the public.

6.0 Environmental Consideration

A review has determined that the proposed change would not change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, and would not change an inspection or surveillance requirement. Furthermore, the proposed change does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed change meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed change.

7.0 References

1. Susquehanna, Unit 1, Licensee Event Report 2002-008-00, dated February 2, 2004.
2. Nine Mile Point - Unit 1, Amendment 170, February 20, 2001.
3. Monticello, Amendment 107, November 24, 1999.

Revision History

OG Revision 0 Revision Status: Closed

Revision Proposed by: BWROG

Revision Description:
Original Issue

Owners Group Review Information

Date Originated by OG: 17-Aug-04

Owners Group Comments:
(No Comments)

Owners Group Resolution: Superceeded Date: 10-Jan-05

OG Revision 1 Revision Status: Active

Revision Proposed by: BWROG

Revision Description:
1) Added "initiated in conjunction with an inservice leak or hydrostatic test" to the 3rd bullet in the LCO (and propagated this throughout Bases and Justification). This supports clarification that scram time testing is allowed at > 200F only for the scram time testing that follows completion of the ILHT. There is no intent to propose > 200F for any other testing --- all allowances are ultimately related to ILHT. However, other testing is allowed IF in conjunction with the ILHT &/or scram time testing as listed in the LCO.

OG Revision 1 **Revision Status: Active**

(2) Removed RCS Specific Activity prerequisite and various references in Bases and Justification

(3) Deleted the Bases "e.g., ..." that had EFCVs and created confusion for the BWR6s

(4) Applicability Bases were revised to eliminate a confusing sentence.

Owners Group Review Information

Date Originated by OG: 10-Jan-05

Owners Group Comments:
(No Comments)

Owners Group Resolution: Approved Date: 01-Feb-05

TSTF Review Information

TSTF Received Date: 07-Feb-05 Date Distributed for Review: 07-Feb-05

OG Review Completed: ☑ BWOG ☑ WOG ☑ CEOG ☑ BWROG

TSTF Comments:
(No Comments)

TSTF Resolution: Approved Date: 30-Apr-05

Affected Technical Specifications

Bkgnd 3.10.1 Bases	Inservice Leak and Hydrostatic Testing Operation
S/A 3.10.1 Bases	Inservice Leak and Hydrostatic Testing Operation
LCO 3.10.1	Inservice Leak and Hydrostatic Testing Operation
LCO 3.10.1 Bases	Inservice Leak and Hydrostatic Testing Operation
Appl. 3.10.1 Bases	Inservice Leak and Hydrostatic Testing Operation

3.10 SPECIAL OPERATIONS

3.10.1 Inservice Leak and Hydrostatic Testing Operation

LCO 3.10.1 The average reactor coolant temperature specified in Table 1.1-1 for MODE 4 may be changed to "NA," and operation considered not to be in MODE 3; and the requirements of LCO 3.4.9, "Residual Heat Removal (RHR) Shutdown Cooling System - Cold Shutdown," may be suspended to allow reactor coolant temperature > 200°F~~,~~:

- For ~~to allow~~ performance of an inservice leak or hydrostatic test,
- As a consequence of maintaining adequate pressure for an inservice leak or hydrostatic test, or
- As a consequence of maintaining adequate pressure for control rod scram time testing initiated in conjunction with an inservice leak or hydrostatic test,

~~-~~provided the following MODE 3 LCOs are met:

a. LCO 3.3.6.2, "Secondary Containment Isolation Instrumentation," Functions [1, 3, 4 and 5] of Table 3.3.6.2-1,

b. LCO 3.6.4.1, "Secondary Containment,"

c. LCO 3.6.4.2, "Secondary Containment Isolation Valves (SCIVs)," and

d. LCO 3.6.4.3, "Standby Gas Treatment (SGT) System."

APPLICABILITY: MODE 4 with average reactor coolant temperature > [200]°F.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each requirement of the LCO.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more of the above requirements not met.	A.1 ----------NOTE---------- Required Actions to be in MODE 4 include reducing average reactor coolant temperature to ≤ [200]°F. ---------- Enter the applicable Condition of the affected LCO.	Immediately
	OR	
	A.2.1 Suspend activities that could increase the average reactor coolant temperature or pressure.	Immediately
	AND	
	A.2.2 Reduce average reactor coolant temperature to ≤ [200]°F.	24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.1.1	Perform the applicable SRs for the required MODE 3 LCOs.	According to the applicable SRs

B 3.10 SPECIAL OPERATIONS

B 3.10.1 Inservice Leak and Hydrostatic Testing Operation

BASES

BACKGROUND

The purpose of this Special Operations LCO is to allow certain reactor coolant pressure tests to be performed in MODE 4 when the metallurgical characteristics of the reactor pressure vessel (RPV) require the pressure testing at temperatures > 200°F (normally corresponding to MODE 3) or to allow completing these reactor coolant pressure tests when the initial conditions do not require temperatures > 200°F. Furthermore, the purpose is to allow continued performance of control rod scram time testing required by SR 3.1.4.1 or SR 3.1.4.4 if reactor coolant temperatures exceed 200°F when the control rod scram time testing is initiated in conjunction with an inservice leak or hydrostatic test. These control rod scram time tests would be performed in accordance with LCO 3.10.4, "Single Control Rod Withdrawal – Cold Shutdown," during MODE 4 operation.

Inservice hydrostatic testing and system leakage pressure tests required by Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Ref. 1) are performed prior to the reactor going critical after a refueling outage. Recirculation pump operation and a water solid RPV (except for an air bubble for pressure control) are used to achieve the necessary temperatures and pressures required for these tests. The minimum temperatures (at the required pressures) allowed for these tests are determined from the RPV pressure and temperature (P/T) limits required by LCO 3.4.10, "Reactor Coolant System (RCS) Pressure and Temperature (P/T) Limits." These limits are conservatively based on the fracture toughness of the reactor vessel, taking into account anticipated vessel neutron fluence.

With increased reactor vessel fluence over time, the minimum allowable vessel temperature increases at a given pressure. Periodic updates to the RPV P/T limit curves are performed as necessary, based upon the results of analyses of irradiated surveillance specimens removed from the vessel. Hydrostatic and leak testing ~~will~~ may eventually be required with minimum reactor coolant temperatures > 200°F. However, even with required minimum reactor coolant temperatures < 200°F, maintaining RCS temperatures within a small band during the test can be impractical. Removal of heat addition from recirculation pump operation and reactor core decay heat is coarsely controlled by control rod drive hydraulic system flow and reactor water cleanup system non-regenerative heat exchanger operation. Test conditions are focused on maintaining a steady state pressure, and tightly limited temperature control poses an unnecessary burden on the operator and may not be achievable in certain instances.

BASES

BACKGROUND (continued)

The hydrostatic [and/or RCS system leakage] tests requires increasing pressure to approximately [ ]% of design pressure (1250 psig) or [ ] psig., and because of the expected increase in reactor vessel fluence, the minimum allowable vessel temperature according to LCO 3.4.10 is increased to [ ]°F. This increase to [ ]% of design pressure does not exceed the Safety Limit of 1375 psig. Scram time testing required by SR 3.1.4.1 and SR 3.1.4.4 requires reactor pressures > [800] psig.

Other testing may be performed in conjunction with the allowances for inservice leak or hydrostatic tests and control rod scram time tests.

APPLICABLE SAFETY ANALYSES

Allowing the reactor to be considered in MODE 4 during hydrostatic or leak testing, when the reactor coolant temperature is > 200°F, during, or as a consequence of, hydrostatic or leak testing, or as a consequence of control rod scram time testing initiated in conjunction with an inservice leak or hydrostatic test, effectively provides an exception to MODE 3 requirements, including OPERABILITY of primary containment and the full complement of redundant Emergency Core Cooling Systems. Since the hydrostatic or leak tests are performed nearly water solid, at low decay heat values, and near MODE 4 conditions, the stored energy in the reactor core will be very low. Under these conditions, the potential for failed fuel and a subsequent increase in coolant activity above the LCO 3.4.7, "RCS Specific Activity," limits are minimized. In addition, the secondary containment will be OPERABLE, in accordance with this Special Operations LCO, and will be capable of handling any airborne radioactivity or steam leaks that could occur during the performance of hydrostatic or leak testing. The required pressure testing conditions provide adequate assurance that the consequences of a steam leak will be conservatively bounded by the consequences of the postulated main steam line break outside of primary containment described in Reference 2. Therefore, these requirements will conservatively limit radiation releases to the environment.

In the event of a large primary system leak, the reactor vessel would rapidly depressurize, allowing the low pressure core cooling systems to operate. The capability of the low pressure coolant injection and core spray subsystems, as required in MODE 4 by LCO 3.5.2, "ECCS - Shutdown," would be more than adequate to keep the core flooded under this low decay heat load condition. Small system leaks would be detected by leakage inspections before significant inventory loss occurred.

For the purposes of this test, the protection provided by normally required MODE 4 applicable LCOs, in addition to the secondary containment requirements required to be met by this Special Operations LCO, will

ensure acceptable consequences during normal hydrostatic test conditions and during postulated accident conditions.

As described in LCO 3.0.7, compliance with Special Operations LCOs is optional, and therefore, no criteria of 10 CFR 50.36(c)(2)(ii) apply. Special Operations LCOs provide flexibility to perform certain operations by appropriately modifying requirements of other LCOs. A discussion of the criteria satisfied for the other LCOs is provided in their respective Bases.

LCO

As described in LCO 3.0.7, compliance with this Special Operations LCO is optional. Operation at reactor coolant temperatures > 200°F can be in accordance with Table 1.1-1 for MODE 3 operation without meeting this Special Operations LCO or its ACTIONS. This option may be required due to P/T limits, however, which require testing at temperatures > 200°F, performance of inservice leak and hydrostatic testing would also necessitate the inoperability of some subsystems normally required to be OPERABLE when > 200°F. Additionally, even with required minimum reactor coolant temperatures < 200°F, RCS temperatures may drift above 200°F during the performance of inservice leak and hydrostatic testing or during subsequent control rod scram time testing, which is typically performed in conjunction with inservice leak and hydrostatic testing. While this Special Operations LCO is provided for inservice leak and hydrostatic testing, and for scram time testing initiated in conjunction with an inservice leak or hydrostatic test, parallel performance of others tests and inspections is not precluded.

If it is desired to perform these tests while complying with this Special Operations LCO, then the MODE 4 applicable LCOs and specified MODE 3 LCOs must be met. This Special Operations LCO allows changing Table 1.1-1 temperature limits for MODE 4 to "NA" and suspending the requirements of LCO 3.4.9, "Residual Heat Removal (RHR) Shutdown Cooling System - Cold Shutdown." The additional requirements for secondary containment LCOs to be met will provide sufficient protection for operations at reactor coolant temperatures > 200°F for the purpose of performing ~~either~~ an inservice leak or hydrostatic test, and for control rod scram time testing initiated in conjunction with an inservice leak or hydrostatic test.

This LCO allows primary containment to be open for frequent unobstructed access to perform inspections, and for outage activities on various systems to continue consistent with the MODE 4 applicable requirements ~~that are in effect immediately prior to and immediately after this operation~~.

BASES

APPLICABILITY

The MODE 4 requirements may only be modified for the performance of, or as a consequence of, inservice leak or hydrostatic tests, or as a consequence of control rod scram time testing initiated in conjunction with an inservice leak or hydrostatic test, so that these operations can be considered as in MODE 4, even though the reactor coolant temperature is > 200°F. The additional requirement for secondary containment OPERABILITY according to the imposed MODE 3 requirements provides conservatism in the response of the unit to any event that may occur. Operations in all other MODES are unaffected by this LCO.

ACTIONS

A Note has been provided to modify the ACTIONS related to inservice leak and hydrostatic testing operation. Section 1.3, Completion Times, specifies that once a Condition has been entered, subsequent divisions, subsystems, components, or variables expressed in the Condition discovered to be inoperable or not within limits, will not result in separate entry into the Condition. Section 1.3 also specifies that Required Actions of the Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for each requirement of the LCO not met provide appropriate compensatory measures for separate requirements that are not met. As such, a Note has been provided that allows separate Condition entry for each requirement of the LCO.

A.1

If an LCO specified in LCO 3.10.1 is not met, the ACTIONS applicable to the stated requirements are entered immediately and complied with. Required Action A.1 has been modified by a Note that clarifies the intent of another LCO's Required Action to be in MODE 4 includes reducing the average reactor coolant temperature to ≤ 200°F.

A.2.1 and A.2.2

Required Action A.2.1 and Required Action A.2.2 are alternate Required Actions that can be taken instead of Required Action A.1 to restore compliance with the normal MODE 4 requirements, and thereby exit this Special Operation LCO's Applicability. Activities that could further increase reactor coolant temperature or pressure are suspended immediately, in accordance with Required Action A.2.1, and the reactor coolant temperature is reduced to establish normal MODE 4 requirements. The allowed Completion Time of 24 hours for Required Action A.2.2 is based on engineering judgment and provides sufficient time to reduce the average reactor coolant temperature from the highest expected value to ≤ 200°F with normal cooldown procedures. The Completion Time is also consistent with the time provided in LCO 3.0.3 to reach MODE 4 from MODE 3.

SURVEILLANCE REQUIREMENTS	SR 3.10.1.1 The LCOs made applicable are required to have their Surveillances met to establish that this LCO is being met. A discussion of the applicable SRs is provided in their respective Bases.
REFERENCES	1. American Society of Mechanical Engineers, Boiler and Pressure Vessel Code, Section XI. 2. FSAR, Section [15.1.40].

3.10 SPECIAL OPERATIONS

3.10.1 Inservice Leak and Hydrostatic Testing Operation

LCO 3.10.1 The average reactor coolant temperature specified in Table 1.1-1 for MODE 4 may be changed to "NA," and operation considered not to be in MODE 3; and the requirements of LCO 3.4.10, "Residual Heat Removal (RHR) Shutdown Cooling System - Cold Shutdown," may be suspended to allow reactor coolant temperature > 200°F:~~,~~

- For ~~to allow~~ performance of an inservice leak or hydrostatic test,
- As a consequence of maintaining adequate pressure for an inservice leak or hydrostatic test, or
- As a consequence of maintaining adequate pressure for control rod scram time testing initiated in conjunction with an inservice leak or hydrostatic test,

~~-~~provided the following MODE 3 LCOs are met:

a. LCO 3.3.6.2, "Secondary Containment Isolation Instrumentation," [Functions 1, 3, 4, and 5] of Table 3.3.6.2-1,

b. LCO 3.6.4.1, "[Secondary Containment],"

c. LCO 3.6.4.2, "Secondary Containment Isolation Valves (SCIVs)," and

d. LCO 3.6.4.3, "Standby Gas Treatment (SGT) System."

APPLICABILITY: MODE 4 with average reactor coolant temperature > [200]°F.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each requirement of the LCO.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more of the above requirements not met.	A.1 ----------NOTE---------- Required Actions to be in MODE 4 include reducing average reactor coolant temperature to ≤ [200]°F. ---------- Enter the applicable Condition of the affected LCO.	Immediately
	OR	
	A.2.1 Suspend activities that could increase the average reactor coolant temperature or pressure.	Immediately
	AND	
	A.2.2 Reduce average reactor coolant temperature to ≤ [200]°F.	24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.1.1	Perform the applicable SRs for the required MODE 3 LCOs.	According to the applicable SRs

B 3.10 SPECIAL OPERATIONS

B 3.10.1 Inservice Leak and Hydrostatic Testing Operation

BASES

BACKGROUND

The purpose of this Special Operations LCO is to allow certain reactor coolant pressure tests to be performed in MODE 4 when the metallurgical characteristics of the reactor pressure vessel (RPV) require the pressure testing at temperatures > 200°F (normally corresponding to MODE 3) or to allow completing these reactor coolant pressure tests when the initial conditions do not require temperatures > 200°F. Furthermore, the purpose is to allow continued performance of control rod scram time testing required by SR 3.1.4.1 or SR 3.1.4.4 if reactor coolant temperatures exceed 200°F when the control rod scram time testing is initiated in conjunction with an inservice leak or hydrostatic test. These control rod scram time tests would be performed in accordance with LCO 3.10.4, "Single Control Rod Withdrawal – Cold Shutdown," during MODE 4 operation.

Inservice hydrostatic testing and system leakage pressure tests required by Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Ref. 1) are performed prior to the reactor going critical after a refueling outage. Recirculation pump operation and a water solid RPV (except for an air bubble for pressure control) are used to achieve the necessary temperatures and pressures required for these tests. The minimum temperatures (at the required pressures) allowed for these tests are determined from the RPV pressure and temperature (P/T) limits required by LCO 3.4.11, "Reactor Coolant System (RCS) Pressure and Temperature (P/T) Limits." These limits are conservatively based on the fracture toughness of the reactor vessel, taking into account anticipated vessel neutron fluence.

With increased reactor vessel fluence over time, the minimum allowable vessel temperature increases at a given pressure. Periodic updates to the RPV P/T limit curves are performed as necessary, based on the results of analyses of irradiated surveillance specimens removed from the vessel. Hydrostatic and leak testing ~~will~~may eventually be required with minimum reactor coolant temperatures > 200°F. However, even with required minimum reactor coolant temperatures < 200°F, maintaining RCS temperatures within a small band during the test can be impractical. Removal of heat addition from recirculation pump operation and reactor core decay heat is coarsely controlled by control rod drive hydraulic system flow and reactor water cleanup system non-regenerative heat exchanger operation. Test conditions are focused on maintaining a steady state pressure, and tightly limited temperature control poses an unnecessary burden on the operator and may not be achievable in certain instances.

BASES

BACKGROUND (continued)

The hydrostatic [and/or RCS system leakage] tests requires increasing pressure to ~~[ ]% of design pressure (1250 psig) or~~ approximately [ ] psig~~., and because of the expected increase in reactor vessel fluence, the minimum allowable vessel temperature according to LCO 3.4.11 is increased to [ ]°F. This increase to [ ]% of design pressure does not exceed the Safety Limit of 1375 psig.~~ Scram time testing required by SR 3.1.4.1 and SR 3.1.4.4 requires reactor pressures > [800] psig.

Other testing may be performed in conjunction with the allowances for inservice leak or hydrostatic tests and control rod scram time tests.

APPLICABLE SAFETY ANALYSES

Allowing the reactor to be considered in MODE 4 ~~during hydrostatic or leak testing,~~ when the reactor coolant temperature is > 200°F, during, or as a consequence of, hydrostatic or leak testing, or as a consequence of control rod scram time testing initiated in conjunction with an inservice leak or hydrostatic test, effectively provides an exception to MODE 3 requirements, including OPERABILITY of primary containment and the full complement of redundant Emergency Core Cooling Systems (ECCS). Since the ~~hydrostatic or leak~~ tests are performed nearly water solid, at low decay heat values, and near MODE 4 conditions, the stored energy in the reactor core will be very low. Under these conditions, the potential for failed fuel and a subsequent increase in coolant activity above the limits of LCO 3.4.8, "Reactor Coolant System (RCS) Specific Activity," are minimized. In addition, the secondary containment will be OPERABLE, in accordance with this Special Operations LCO, and will be capable of handling any airborne radioactivity or steam leaks that could occur during the performance of hydrostatic or leak testing. The required pressure testing conditions provide adequate assurance that the consequences of a steam leak will be conservatively bounded by the consequences of the postulated main steam line break outside of primary containment described in Reference 2. Therefore, these requirements will conservatively limit radiation releases to the environment.

In the event of a large primary system leak, the reactor vessel would rapidly depressurize, allowing the low pressure core cooling systems to operate. The capability of the low pressure coolant injection and low pressure core spray subsystems, as required in MODE 4 by LCO 3.5.2, "ECCS - Shutdown," would be more than adequate to keep the core flooded under this low decay heat load condition. Small system leaks would be detected by leakage inspections before significant inventory loss occurred.

For the purposes of this test, the protection provided by normally required MODE 4 applicable LCOs, in addition to the secondary containment requirements required to be met by this Special Operations LCO, will

ensure acceptable consequences during normal hydrostatic test conditions and during postulated accident conditions.

As described in LCO 3.0.7, compliance with Special Operations LCOs is optional, and therefore, no criteria of 10 CFR 50.36(c)(2)(ii) apply. Special Operations LCOs provide flexibility to perform certain operations by appropriately modifying requirements of other LCOs. A discussion of the criteria satisfied for the other LCOs is provided in their respective Bases.

LCO

As described in LCO 3.0.7, compliance with this Special Operations LCO is optional. Operation at reactor coolant temperatures > 200°F, can be in accordance with Table 1.1-1 for MODE 3 operation without meeting this Special Operations LCO or its ACTIONS. This option may be required due to P/T limits, however, which require testing at temperatures > 200°F, performance of inservice leak and hydrostatic testing would also necessitate the inoperability of some subsystems normally required to be OPERABLE when > 200°F. Additionally, even with required minimum reactor coolant temperatures < 200°F, RCS temperatures may drift above 200°F during the performance of inservice leak and hydrostatic testing or during subsequent control rod scram time testing, which is typically performed in conjunction with inservice leak and hydrostatic testing. While this Special Operations LCO is provided for inservice leak and hydrostatic testing, and for scram time testing initiated in conjunction with an inservice leak or hydrostatic test, parallel performance of others tests and inspections is not precluded.

If it is desired to perform these tests while complying with this Special Operations LCO, then the MODE 4 applicable LCOs and specified MODE 3 LCOs must be met. This Special Operations LCO allows changing Table 1.1-1 temperature limits for MODE 4 to "NA" and suspending the requirements of LCO 3.4.10, "Residual Heat Removal (RHR) Shutdown Cooling System - Cold Shutdown." The additional requirements for secondary containment LCOs to be met will provide sufficient protection for operations at reactor coolant temperatures > 200°F for the purposes of performing ~~either~~ an inservice leak or hydrostatic test, and for control rod scram time testing initiated in conjunction with an inservice leak or hydrostatic test.

This LCO allows primary containment to be open for frequent unobstructed access to perform inspections, and for outage activities on various systems to continue consistent with the MODE 4 applicable requirements ~~that are in effect immediately prior to and immediately after this operation~~.

BASES

APPLICABILITY

The MODE 4 requirements may only be modified for the performance of, or as a consequence of, inservice leak or hydrostatic tests, or as a consequence of control rod scram time testing initiated in conjunction with an inservice leak or hydrostatic test, so that these operations can be

considered as in MODE 4, even though the reactor coolant temperature is > 200°F. The additional requirement for secondary containment OPERABILITY according to the imposed MODE 3 requirements provides conservatism in the response of the unit to any event that may occur. Operations in all other MODES are unaffected by this LCO.

ACTIONS

A Note has been provided to modify the ACTIONS related to inservice leak and hydrostatic testing operation. Section 1.3, Completion Times, specifies once a Condition has been entered, subsequent divisions, subsystems, components, or variables expressed in the Condition discovered to be inoperable or not within limits, will not result in separate entry into the Condition. Section 1.3 also specifies Required Actions of the Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for each requirement of the LCO not met provide appropriate compensatory measures for separate requirements that are not met. As such, a Note has been provided that allows separate Condition entry for each requirement of the LCO.

A.1

If an LCO specified in LCO 3.10.1 is not met, the ACTIONS applicable to the stated requirements shall be entered immediately and complied with. Required Action A.1 has been modified by a Note that clarifies the intent of another LCO's Required Action to be in MODE 4 includes reducing the average reactor coolant temperature to ≤ 200°F.

A.2.1 and A.2.2

Required Actions A.2.1 and A.2.2 are alternate Required Actions that can be taken instead of Required Action A.1 to restore compliance with the normal MODE 4 requirements, and thereby exit this Special Operations LCO's Applicability. Activities that could further increase reactor coolant temperature or pressure are suspended immediately, in accordance with Required Action A.2.1, and the reactor coolant temperature is reduced to establish normal MODE 4 requirements. The allowed Completion Time of 24 hours for Required Action A.2.2 is based on engineering judgment and provides sufficient time to reduce the average reactor coolant temperature from the highest expected value to ≤ 200°F with normal cooldown procedures. The Completion Time is also consistent with the time provided in LCO 3.0.3 for reaching MODE 4 from MODE 3.

SURVEILLANCE REQUIREMENTS

SR 3.10.1.1

The LCOs made applicable are required to have their Surveillances met to establish that this LCO is being met. A discussion of the applicable SRs is provided in their respective Bases.

REFERENCES

1. American Society of Mechanical Engineers, Boiler and Pressure Vessel Code, Section XI.

2. FSAR, Section [15.1.40].